CLAIMS

1. A method for protecting a MEMS structure during a dicing of a MEMS wafer to produce individual MEMS dies, comprising the steps of:

(a) preparing a MEMS wafer having a plurality of MEMS structure sites thereon;

(b) mounting, upon the MEMS wafer, a wafer cap to produce a laminated MEMS wafer, the wafer cap being recessed in areas corresponding to locations of the MEMS structure sites on the MEMS wafer; and

(c) dicing the laminated MEMS wafer into a plurality of MEMS dies.

2. The method as claimed in claim 1, wherein the laminated MEMS wafer is diced using a saw.

3. The method as claimed in claim 1, wherein the laminated MEMS wafer is diced using a laser.

4. The method as claimed in claim 1, wherein the laminated MEMS wafer is diced using scribing and breaking.

5. The method as claimed in claim 1, wherein the wafer cap is a cover tape with an adhesive medium.

6. The method as claimed in claim 1, wherein the wafer cap includes an adhesive medium.

7. The method as claimed in claim 6, wherein the adhesive medium is an ultraviolet light releasable medium.

8. The method as claimed in claim 6, wherein the adhesive medium is a heat releasable medium.

9. The method as claimed in claim 6, wherein the adhesive medium is a combination of an ultraviolet light and heat releasable medium.

10. The method as claimed in claim 6, wherein the adhesive medium comprises a thermoplastic organic material.

11. The method as claimed in claim 6, wherein the adhesive medium comprises an ultraviolet light sensitive organic material.

12. The method as claimed in claim 6, wherein the adhesive medium comprises a solder material.

13. The method as claimed in claim 1, wherein the wafer cap is attached to the MEMS wafer through mechanical means.

14. The method as claimed in claim 1, wherein the wafer cap is attached to the MEMS wafer through bonds produced by applying the wafer cap to the MEMS wafer with a predetermined amount of pressure.

15. The method as claimed in claim 1, further comprising the step of:

(d) applying a contiguous tape on a backside of the MEMS wafer, the backside of the MEMS wafer being a side opposite of a side having the MEMS structure sites located thereon.

16. The method as claimed in claim 15, wherein the contiguous tape is applied to a backside of the MEMS wafer after the wafer cap is mounted on the MEMS wafer.

17. The method as claimed in claim 15, wherein the contiguous tape is applied to a backside of the MEMS wafer before the wafer cap is mounted on the MEMS wafer.

18. The method as claimed in claim 15, wherein the contiguous tape is applied to a backside of the MEMS wafer before the laminated MEMS wafer is sawn.

19. The method as claimed in claim 15, wherein the contiguous tape is not cut when the laminated MEMS wafer is diced.

20. The method as claimed in claim 5, further comprising the step of:

(d) applying a contiguous tape on a backside of the MEMS wafer, the backside of the MEMS wafer being a side opposite of a side having the MEMS structure sites located thereon.

21. The method as claimed in claim 20, wherein the contiguous tape is applied to a backside of the MEMS wafer after the wafer cap is mounted on the MEMS wafer.

22. The method as claimed in claim 20, wherein the contiguous tape is applied to a backside of the MEMS wafer before the wafer cap is mounted on the MEMS wafer.

23. The method as claimed in claim 20, wherein the contiguous tape is applied to a backside of the MEMS wafer before the laminated MEMS wafer is sawn.

24. The method as claimed in claim 20, wherein the contiguous tape is not cut when the laminated MEMS wafer is diced.

25. The method as claimed in claim 1, wherein the wafer cap comprises silicon-based material.

26. The method as claimed in claim 25, wherein the wafer cap includes an organic adhesive medium.

27. The method as claimed in claim 1, wherein the wafer cap comprises a glass-based material.

28. The method as claimed in claim 1, wherein the wafer cap comprises a ceramic-based material.

29. The method as claimed in claim 1, wherein the wafer cap comprises a polymer-based material.

30. The method as claimed in claim 1, wherein the laminated MEMS wafer is diced with a wafer saw with a wafer cap side of the laminated MEMS wafer facing towards a cutting device of the wafer saw such that the wafer cap is sawn before the MEMS wafer.

31. A method for protecting a MEMS structure during a production of individual MEMS dies, comprising the steps of:

(a) fabricating a MEMS wafer having a plurality of MEMS structure sites thereon;

(b) fabricating a wafer cap;

(c) bonding the wafer cap to the MEMS wafer to produce a laminated MEMS wafer, the wafer cap being recessed in areas corresponding to locations of the MEMS structure sites on the MEMS wafer;

(d) dicing the laminated MEMS wafer into a plurality of MEMS dies; and

(e) removing the wafer cap from the laminated MEMS wafer.

32. The method as claimed in claim 31, further comprising the step of:

(f) removing individual dies from the diced laminated MEMS wafer before the wafer cap is removed from the laminated MEMS wafer.

33. The method as claimed in claim 31, further comprising the step of:

(f) mounting dies from the diced laminated MEMS wafer into a package before the wafer cap is removed from the laminated MEMS wafer.

34. The method as claimed in claim 31, further comprising the step of:

(f) mounting dies from the diced laminated MEMS wafer into a package after the wafer cap is removed from the laminated MEMS wafer.

35. The method as claimed in claim 31, further comprising the steps of:

(f) removing individual dies from the diced laminated MEMS wafer before the wafer cap is removed from the laminated MEMS wafer; and

(g) mounting the dies removed from the diced laminated MEMS wafer into a package before the wafer cap is removed from the laminated MEMS wafer.

36. The method as claimed in claim 31, wherein the wafer cap includes an adhesive medium.

37. The method as claimed in claim 36, wherein the adhesive medium is an ultraviolet light releasable medium.

38. The method as claimed in claim 36, wherein the adhesive medium is a heat releasable medium.

39. The method as claimed in claim 36, wherein the adhesive medium is a combination of an ultraviolet light and heat releasable medium.

40. The method as claimed in claim 36, wherein the adhesive medium comprises a thermoplastic organic material.

41. The method as claimed in claim 36, wherein the adhesive medium comprises an ultraviolet light sensitive organic material.

42. The method as claimed in claim 36, wherein the adhesive medium comprises a solder material.

43. The method as claimed in claim 31, further comprising the step of:

(f) applying a contiguous tape on a backside of the MEMS wafer, the backside of the MEMS wafer being a side opposite of a side having the wafer cap located thereon.

44. The method as claimed in claim 43, wherein the contiguous tape is applied to a backside of the MEMS wafer after the wafer cap is mounted on the MEMS wafer.

45. The method as claimed in claim 43, wherein the contiguous tape is applied to a backside of the MEMS wafer before the wafer cap is mounted on the MEMS wafer.

46. The method as claimed in claim 43, wherein the contiguous tape is applied to a backside of the MEMS wafer before the laminated MEMS wafer is sawn.

47. The method as claimed in claim 31, wherein the wafer cap comprises silicon-based material.

48. The method as claimed in claim 31, wherein the wafer cap comprises a glass-based material.

49. The method as claimed in claim 31, wherein the wafer cap comprises a ceramic-based material.

50. The method as claimed in claim 31, wherein the wafer cap comprises a polymer-based material.

51. The method as claimed in claim 31, wherein the laminated MEMS wafer is sawn on a wafer saw with a wafer cap side of the laminated MEMS wafer facing towards a cutting device such that the wafer cap is sawn before the MEMS wafer.

52. The method as claimed in claim 31, wherein the wafer cap is attached to the MEMS wafer through mechanical means.

53. The method as claimed in claim 31, wherein the wafer cap is attached to the MEMS wafer through bonds produced by applying the wafer cap to the MEMS wafer with a predetermined amount of pressure.

54. A laminated MEMS wafer, comprising:

a MEMS wafer having a plurality of MEMS structure sites located thereon; and

a removable wafer cap;

said removable wafer cap being bonded to the MEMS wafer to produce a laminated MEMS wafer, the wafer cap being recessed in areas corresponding to locations of the MEMS structure sites on the MEMS wafer.

55. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap includes a releasable adhesive medium.

56. The laminated MEMS wafer as claimed in claim 55, wherein the releasable adhesive medium is an ultraviolet light releasable medium.

57. The laminated MEMS wafer as claimed in claim 55, wherein the releasable adhesive medium is a heat releasable medium.

58. The laminated MEMS wafer as claimed in claim 55, wherein the releasable adhesive medium is a combination of an ultraviolet light and heat releasable medium.

59. The laminated MEMS wafer as claimed in claim 55, wherein the releasable adhesive medium comprises a thermoplastic organic material.

60. The laminated MEMS wafer as claimed in claim 55, wherein the releasable adhesive medium comprises an ultraviolet light sensitive organic material.

61. The laminated MEMS wafer as claimed in claim 55, wherein the releasable adhesive medium comprises a solder material.

62. The laminated MEMS wafer as claimed in claim 54, further comprising:

a contiguous tape applied on a backside of the MEMS wafer, the backside of the MEMS wafer being a side opposite of a side having the MEMS structure sites located thereon.

63. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap comprises silicon-based material.

64. The laminated MEMS wafer as claimed in claim 58, wherein the releasable adhesive medium comprises an organic material.

65. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap comprises a glass-based material.

66. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap comprises a ceramic-based material.

67. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap comprises a polymer-based material.

68. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap is attached to the MEMS wafer through mechanical means.

69. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap is attached to the MEMS wafer through bonds produced by applying the wafer cap to the MEMS wafer with a predetermined amount of pressure.

70. A method for protecting a MEMS structure during a dicing of a MEMS wafer to produce individual MEMS dies, comprising the steps of:

(a) preparing a MEMS wafer having a plurality of MEMS structure sites thereon;

(b) mounting, using an adhesive layer, a wafer cap, to produce a laminated MEMS wafer, the wafer cap being recessed in areas corresponding to locations of the MEMS structure sites on the MEMS wafer; and

(c) dicing the laminated MEMS wafer into a plurality of MEMS dies.

71. The method as claimed in claim 70, wherein the laminated MEMS wafer is diced using a saw.

72. The method as claimed in claim 70, wherein the laminated MEMS wafer is diced using a laser.

73. The method as claimed in claim 70, wherein the laminated MEMS wafer is diced using scribing and breaking.

74. The method as claimed in claim 70, wherein the adhesive layer is an ultraviolet light releasable medium.

75. The method as claimed in claim 70, wherein the adhesive layer is a heat releasable medium.

76. The method as claimed in claim 70, wherein the adhesive layer is a combination of an ultraviolet light and heat releasable medium.

77. The method as claimed in claim 70, wherein the adhesive layer comprises a thermoplastic organic material.

78. The method as claimed in claim 70, wherein the adhesive layer comprises an ultraviolet light sensitive organic material.

79. The method as claimed in claim 70, further comprising the step of:

(d) applying a contiguous tape on a backside of the MEMS wafer, the backside of the MEMS wafer being a side opposite of a side having the MEMS structure sites located thereon.

80. The method as claimed in claim 75, wherein the contiguous tape is applied to a backside of the MEMS wafer after the wafer cap is mounted on the MEMS wafer.

81. The method as claimed in claim 75, wherein the contiguous tape is applied to a backside of the MEMS wafer before the wafer cap is mounted on the MEMS wafer.

82. The method as claimed in claim 70, wherein the wafer cap comprises silicon-based material.

83. The method as claimed in claim 82, wherein the adhesive layer is an organic adhesive medium.

84. The method as claimed in claim 70, wherein the wafer cap comprises a glass-based material.

85. The method as claimed in claim 70, wherein the wafer cap comprises a ceramic-based material.

86. The method as claimed in claim 70, wherein the wafer cap comprises a polymer-based material.

87. The method as claimed in claim 70, wherein the laminated MEMS wafer is diced with a wafer saw with a wafer cap side of the laminated MEMS wafer facing towards a cutting device of the wafer saw such that the wafer cap is sawn before the MEMS wafer.

88. The method as claimed in claim 70, wherein the adhesive layer is applied to the MEMS wafer around the MEMS structure sites.

89. The method as claimed in claim 70, wherein the adhesive layer is applied to the wafer caps at non-recessed areas.

90. The method as claimed in claim 70, further comprising the step of:

(d) removing individual dies from the diced laminated MEMS wafer before the wafer cap is removed from the laminated MEMS wafer.

91. The method as claimed in claim 70, further comprising the step of:

(d) mounting dies from the diced laminated MEMS wafer into a package before the wafer cap is removed from the laminated MEMS wafer.

92. The method as claimed in claim 70, further comprising the step of:

(d) mounting dies from the diced laminated MEMS wafer into a package after the wafer cap is removed from the laminated MEMS wafer.

93. The method as claimed in claim 70, wherein the wafer cap is a cover tape with an adhesive medium.

94. The method as claimed in claim 93, further comprising the step of:

(d) applying a contiguous tape on a backside of the MEMS wafer, the backside of the MEMS wafer being a side opposite of a side having the MEMS structure sites located thereon.

95. The method as claimed in claim 94, wherein the contiguous tape is applied to a backside of the MEMS wafer after the wafer cap is mounted on the MEMS wafer.

96. The method as claimed in claim 94, wherein the contiguous tape is applied to a backside of the MEMS wafer before the wafer cap is mounted on the MEMS wafer.

97. The method as claimed in claim 1, wherein the wafer cap comprises a metal.

98. The method as claimed in claim 31, wherein the wafer cap comprises a metal.

99. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap comprises a metal.

100. The method as claimed in claim 70, wherein the wafer cap comprises a metal.

101. The method as claimed in claim 1, wherein the wafer cap comprises a static dissipative material.

102. The method as claimed in claim 31, wherein the wafer cap comprises a static dissipative material.

103. The laminated MEMS wafer as claimed in claim 54, wherein the wafer cap comprises a static dissipative material.

104. The method as claimed in claim 70, wherein the wafer cap comprises a static dissipative material.

105. The method as claimed in claim 15, wherein the contiguous tape comprises a static dissipative material.

106. The method as claimed in claim 20, wherein the contiguous tape comprises a static dissipative material.

107. The method as claimed in claim 43, wherein the contiguous tape comprises a static dissipative material.

108. The laminated MEMS wafer as claimed in claim 62, wherein the contiguous tape comprises a static dissipative material.

109. The method as claimed in claim 79, wherein the contiguous tape comprises a static dissipative material.

110. The method as claimed in claim 94, wherein the contiguous tape comprises a static dissipative material.